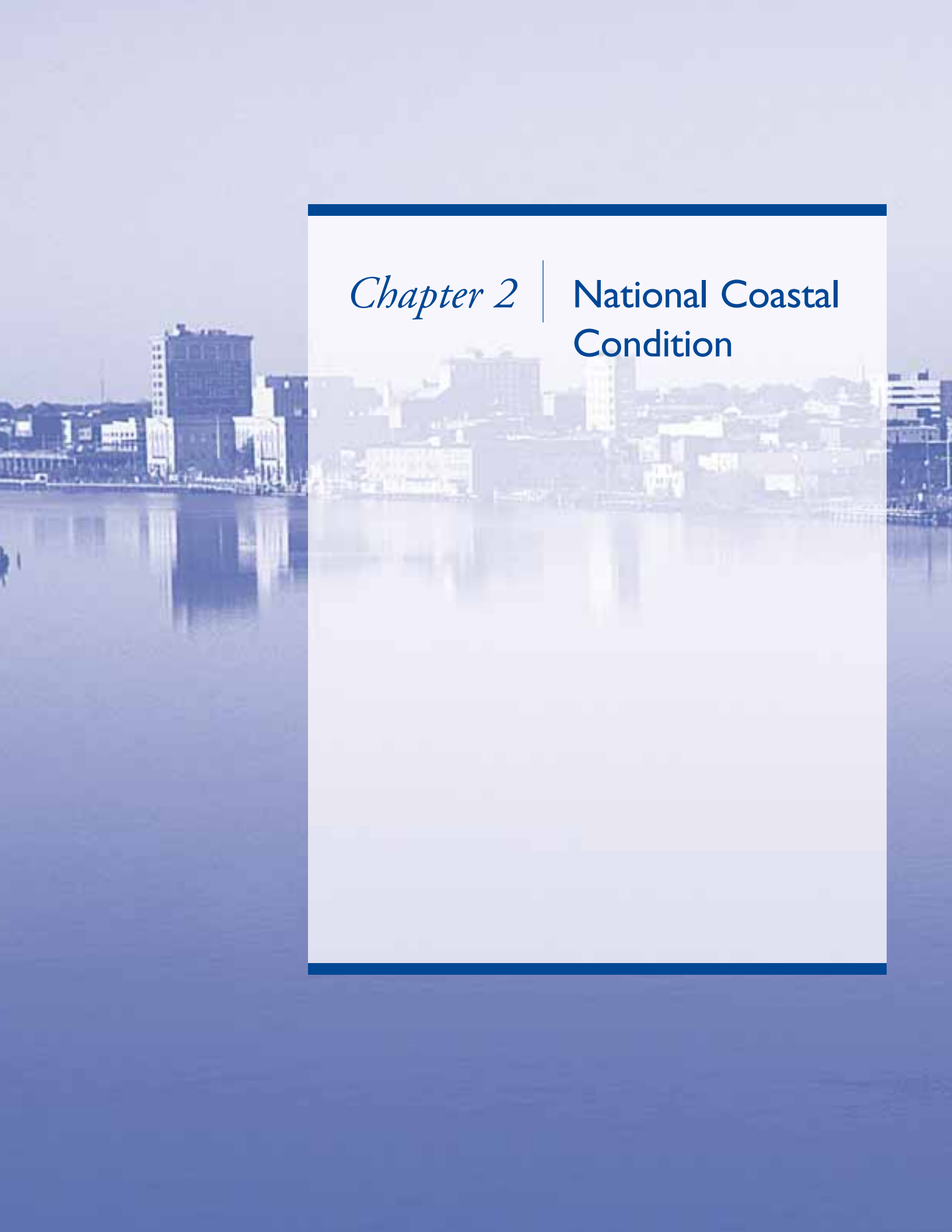

Chapter 2 National Coastal Condition

National Coastal Condition

The overall condition of estuaries in the United States is fair. Only one of the five indicators of estuarine condition received a poor overall rating, the coastal habitat index. The water quality index and the fish tissue contaminants index received a fair rating, and the benthic index and sediment quality index were rated fair to poor (Figure 2-1 summarizes U.S. estuarine condition). These ratings are based on samples collected at 2,073 estuarine sites in the conterminous 48 states (Figure 2-2) between 1997 and 2000 (about 90% of the samples were collected in 1999 and 2000). Of the five summary indicators (water quality index, sediment index, benthic index, coastal habitat index, and fish tissue contaminants index), only the fish tissue contaminants index was rated good for any region of the United States.

The water quality index is rated fair throughout the estuaries of the United States, although estuarine waters in the Northeast Coast region appear to have poorer water quality conditions than those in other regions of the country. The sediment index is poor in Northeast Coast and Puerto Rico estuaries and in the Great Lakes;

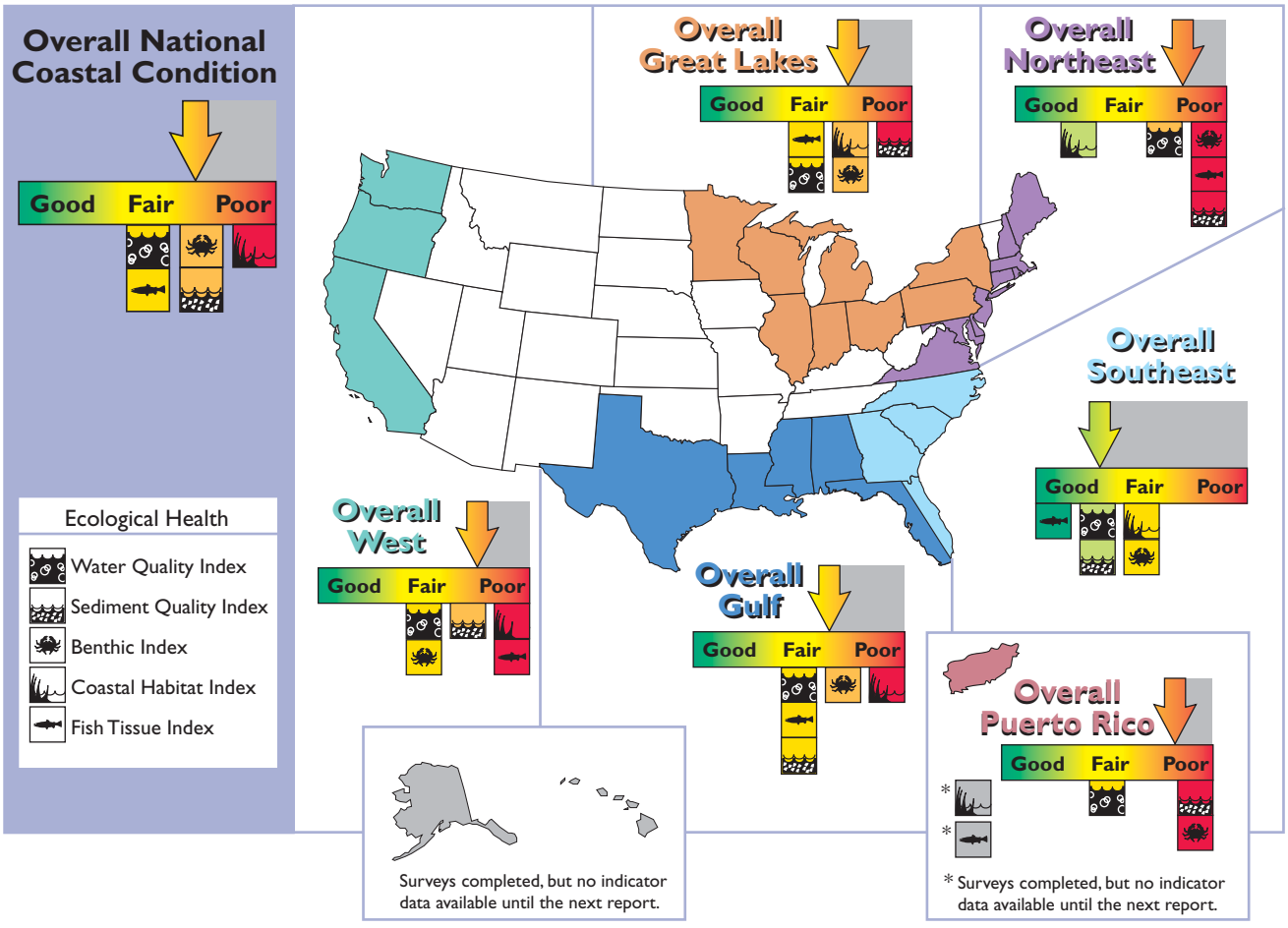

Figure 2-1. Overall national and regional coastal condition between 1997 and 2000.

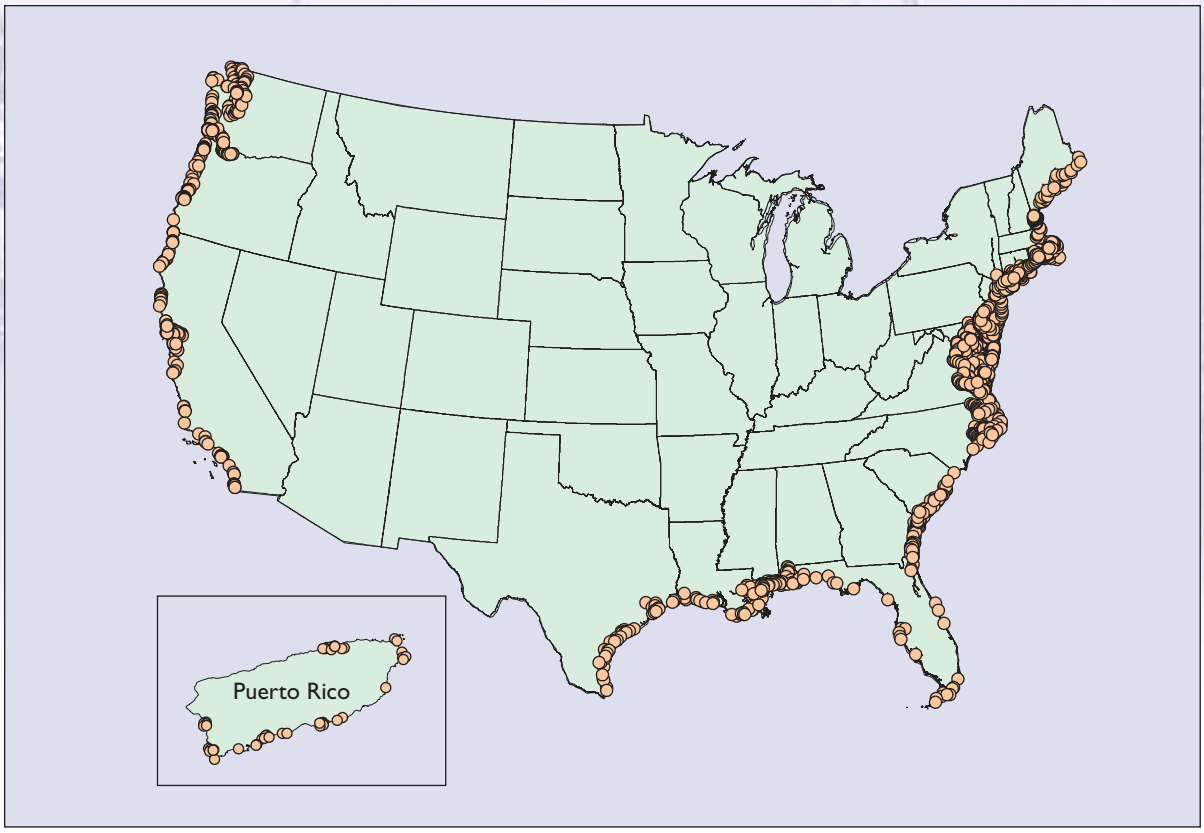

Figure 2-2. Sampling stations for the 1999–2000 NCA Program and for the coastal portion of the 1997–1998 Mid-Atlantic Integrated Assessment (U.S. EPA/EMAP and NCA).

borderline fair in West Coast estuaries; fair in the Gulf Coast estuaries; and borderline good in Southeast Coast estuaries. The benthic index shows that conditions are poor in the Northeast Coast and Puerto Rico, borderline fair in the Gulf Coast and Great Lakes, and fair in the Southeast Coast and West Coast. Condition as measured by fish tissue contaminants is poor in Northeast Coast and West Coast estuaries and fair to good in the remainder of the country.

More specifically, 21% of estuarine area in the United States (excluding the Great Lakes) is unimpaired for human and/or aquatic life uses (Figure 2-3). About 28% of estuarine area is impaired for aquatic life use, 22% is impaired for human use, and an additional 44% is threatened for both uses. Impaired aquatic life use was indicated by lower-than-expected biodiversity, increased abundance of pollution-tolerant species, decreased abundance of pollution-sensitive species, poor water quality condition, poor sediment quality, and coastal wetland losses. Impaired human use was defined as exceedances of fish tissue contaminant risk-based guidelines for consumption (based on four 8-ounce meals per month). Threatened use is equivalent to fair overall condition for any of the indicators.

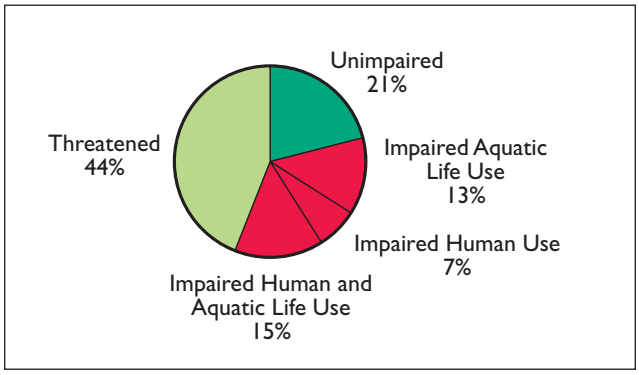

Figure 2-3. National estuarine condition (U.S. EPA/NCA).

Coastal Monitoring Data

This section presents the monitoring data used to rate the five indices of estuarine condition. These calculations do not include proportional area and location data for the Great Lakes. Due to sampling design differences in the data sets, no areal estimates for the Great Lakes can be determined. Although the Great Lakes data are not presented in this section, they are addressed when discussing condition in specific regions of the country. Chapter 7 provides further details of the Great Lakes monitoring data.

Water Quality Index

Data from EPA's NCA Program indicate that the condition of the nation's estuaries, as measured by the water quality index, is fair. This index indicates that 11% of the surface area of the nation's estuaries is in poor water quality condition and an additional 49% is in fair water quality condition (Figure 2-4). Combined, these categories show that 60% of the nation's estuaries are experiencing a moderate-to-high degree of water quality degradation. Poor condition is generally characterized by degradation in water quality response variables (e.g., increased chlorophyll *a* concentration or decreased dissolved oxygen concentration). Fair condition is characterized by some degradation in response variables, but is more likely to be characterized by degradation due to environmental stressors (e.g., increased nutrient concentrations and reduced water clarity). Water quality condition in Northeast Coast estuaries was the poorest in the nation (regionally), with 19% of estuarine waters in poor condition and another 42% in fair condition.

The sampling conducted in the EPA NCA Program has been designed to estimate the percent of estuarine area (nationally or in a region or state) in varying conditions and is displayed as pie diagrams. Many of the figures in this report illustrate environmental measurements made at specific locations (colored dots on maps); however, these dots (color) represent the value of the indicator specifically at the time of sampling. Additional sampling may be required to define variability and to confirm impairment or the lack of impairment at specific locations.

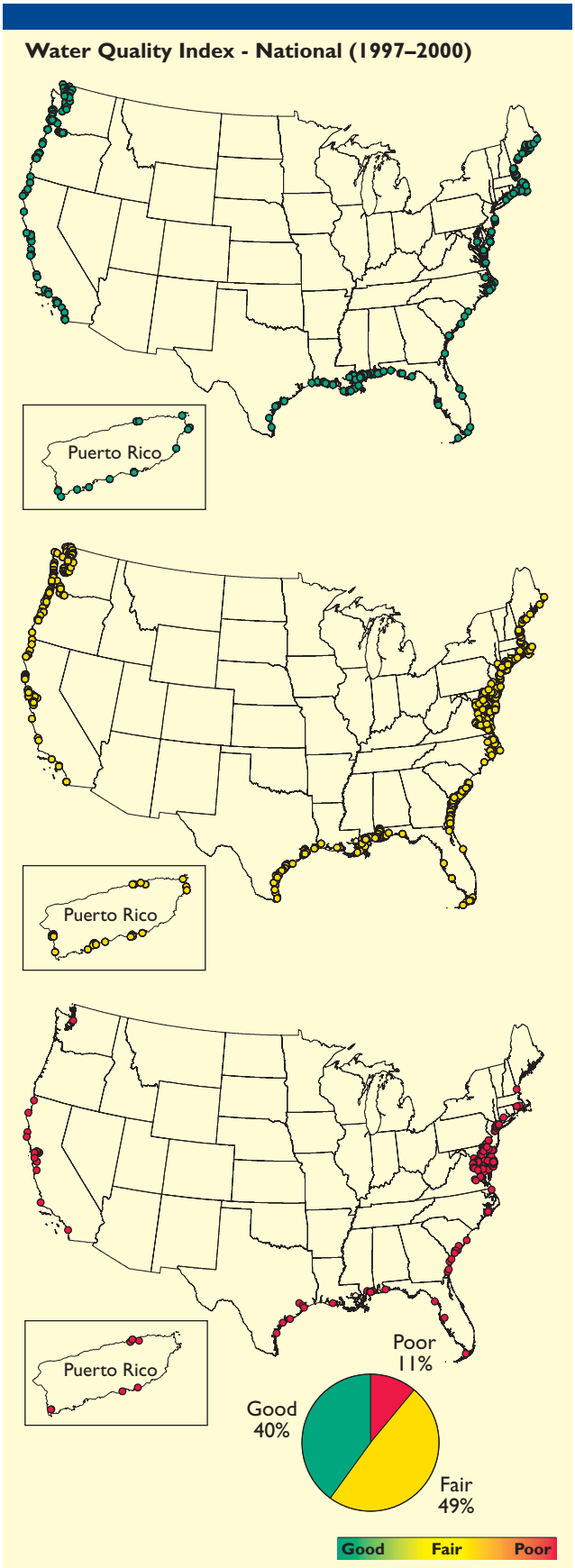

Figure 2-4. National water quality index data (U.S. EPA/NCA).

Nutrients: Nitrogen and Phosphorus

Dissolved inorganic nutrient concentrations for summertime conditions in the nation's estuaries were rated good for DIN and DIP. As a result of phytoplankton uptake and growth, nutrient concentrations in summer are expected to be generally lower than at other times of the year, except on the West Coast, where Pacific upwelling events in summer often produce the year's highest nutrient concentrations. Because of the expectation for lower nutrient concentrations, the reference conditions were modified (reduced by 50%) for East Coast and Gulf Coast estuaries. This reduction in reference concentration better represents the "higher, worst-case" conditions generally observed in these regions in the spring.

DIN concentrations were uniformly low throughout U.S. estuaries, with only 5% of waters characterized as having poor condition (Figure 2-5). Most DIN concentrations that exceeded reference conditions were in Northeast Coast estuaries. DIP concentrations exceeded the regional reference conditions in 9% of estuarine waters (Figure 2-6). These elevated summer DIP concentrations were most often observed in Southeast Coast, West Coast, and Gulf Coast estuaries. Elevated DIN and DIP concentrations in Puerto Rico, Northeast Coast, and Gulf Coast estuaries generally correspond to the areas of elevated chlorophyll *a* concentrations.

Figure 2-5. National DIN concentration data (U.S. EPA/NCA).